

**IN THE CLAIMS**

**1. (Currently Amended)** A mass spectrometer comprising:

an ionization source to produce ions;

a plurality of multipoles to cool, guide or select said ions;

a collision surface for fragmenting said ions; and

a mass analyzer to analyze said ions;[.]

wherein said plurality of multipoles comprise first, second and third multipoles, and

wherein said collision surface is positioned between said second and third multipoles.

**2. (Original)** A mass spectrometer according to claim 1, wherein said ionization source is selected

from the group consisting of electrospray ionization source, nanospray ionization source, microspray

ionization source, matrix assisted laser desorption/ionization, electron ionization, chemical ionization and

electron ionization.

**3. (Original)** A mass spectrometer according to claim 1, wherein said plurality of multipoles further

comprise at least one quadrupole.

**4. (Original)** A mass spectrometer according to claim 1, wherein a potential is applied between said

ionization source and said collision surface to allow said ions to undergo surface induced dissociation.

- 1      5. **(Original)** A mass spectrometer according to claim 1, wherein said mass analyzer is selected from  
2      the group consisting of time-of-flight (TOF) mass analyzer, fourier transform ion cyclotron resonance  
3      (FTICR) mass analyzer, quadrupole ion trap mass analyzer and coaxial multiple reflection TOF mass  
4      analyzer.  
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- 6      6. **(Original)** A mass spectrometer according to claim 1, wherein a potential is applied between said  
7      ionization source and said collision surface such that said ions pass through all of said multipoles without  
8      colliding with said collision surface.  
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- 10     7. **(Cancelled)**  
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- 12     8. **(Currently Amended)** A mass spectrometer according to claim 1 [7], wherein at least one of  
13     said first, second or third multipole comprises a quadrupole.  
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- 15     9. **(Currently Amended)** A mass spectrometer according to claim 1 [7], wherein said first and  
16     second multipoles are arranged coaxially.  
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- 18     10. **(Cancelled)**  
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- 20     11. **(Currently Amended)** A mass spectrometer according to claim 1 [7], wherein said collision  
21     surface is positioned at an angle to a co-axis of said first and second multipoles.

1      12. **(Currently Amended)**    A mass spectrometer according to claim 1 [7], wherein said first  
2      multipole collisionally cools said ions.

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4      13. **(Currently Amended)**    A mass spectrometer according to claim 1 [7], wherein a potential is  
5      applied between said ionization source and said collision surface such that said ions pass through all of  
6      said multipoles without colliding with said collision surface.

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8      14. **(Currently Amended)**    A mass spectrometer according to claim 1 [7], wherein said third  
9      multipole contains a collision gas to fragment said ions.

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11     15. **(Currently Amended)**    A mass spectrometer according to claim 1 [7], wherein said first  
12     multipole selects ions of a predetermined m/z range, wherein a potential is applied between said  
13     ionization source and said collision surface such that said selected ions will not collide with said collision  
14     surface, and wherein said third multipole contains a collision gas to fragment said selected ions.

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1      16. **(Original)** A mass spectrometer comprising:  
2                      an ionization source to produce ions;  
3                      first, second and third multipoles to cool, guide or select said ions;  
4                      a collision surface for fragmenting said ions; and  
5                      a mass analyzer to analyze said ions;  
6                      wherein said first and second multipoles are arranged coaxially;  
7                      wherein said collision surface is positioned between said second and third multipoles; and  
8                      wherein said collision surface is positioned at an angle to said axis of said first and second  
9      multipoles.

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11      17. **(Original)** A mass spectrometer according to claim 16, wherein at least one of said first, second  
12      or third multipole comprises a quadrupole.

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14      18. **(Original)** A mass spectrometer according to claim 16, wherein said first and second multipoles  
15      are arranged coaxially.

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17      19. **(Original)** A mass spectrometer according to claim 16, wherein said collision surface is positioned  
18      between said second and third multipoles.

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20      20. **(Original)** A mass spectrometer according to claim 16, wherein said collision surface is positioned  
21      at an angle to a co-axis of said first and second multipoles.

- 1      21. **(Original)** A mass spectrometer according to claim 16, wherein said first multipole collisionally  
2      cools said ions.  
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- 4      22. **(Original)** A mass spectrometer according to claim 16, wherein a potential is applied between  
5      said ionization source and said collision surface such that said ions pass through all of said multipoles  
6      without colliding with said collision surface.  
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- 8      23. **(Original)** A mass spectrometer according to claim 16, wherein said third multipole contains a  
9      collision gas to fragment said ions.  
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- 11     24. **(Original)** A mass spectrometer according to claim 16, wherein said first multipole selects ions of  
12     a predetermined m/z range, wherein a potential is applied between said ionization source and said  
13     collision surface such that said selected ions will not collide with said collision surface, and wherein said  
14     third multipole contains a collision gas to fragment said selected ions.  
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- 16     25. **(Original)** A mass spectrometer according to claim 16, wherein said ionization source is selected  
17     from the group consisting of electrospray ionization source, nanospray ionization source, microspray  
18     ionization source, matrix assisted laser desorption/ionization, chemical ionization and electron ionization.  
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- 1      26. **(Currently Amended)** A mass spectrometer comprising:
- 2                      at least one sample;
- 3                      an ionization source to produce ions;
- 4                      [a source of laser radiation for producing ions from said sample;]
- 5                      a plurality of multipoles to cool and guide said ions; and
- 6                      a mass analyzer to analyze said ions;[.]
- 7                      wherein said plurality of multipoles comprise first, second and third multipoles, and
- 8                      wherein said sample is positioned between said second and third multipoles.
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- 10     27. **(Original)** A mass spectrometer according to claim 26, wherein said ionization source is selected
- 11     from the group consisting of electrospray ionization source, nanospray ionization source, microspray
- 12     ionization source, matrix assisted laser desorption/ionization, chemical ionization and electron ionization.
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- 14     28. **(Original)** A mass spectrometer according to claim 26, wherein said plurality of multipoles further
- 15     comprise at least one quadrupole.
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- 17     29. **(Original)** A mass spectrometer according to claim 26, wherein said mass analyzer is selected
- 18     from the group consisting of time-of-flight (TOF) mass analyzer, fourier transform ion cyclotron
- 19     resonance (FTICR) mass analyzer, quadrupole ion trap mass analyzer and coaxial multiple reflection
- 20     TOF mass analyzer.
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1     **30. (Cancelled)**

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3     **31. (Currently Amended)**   A mass spectrometer according to claim 26[30], wherein at least one  
4     of said first, second or third multipole comprises a quadrupole.

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6     **32. (Currently Amended)**   A mass spectrometer according to claim 26[30], wherein said first and  
7     second multipoles are arranged coaxially.

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9     **33. (Cancelled)**

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11    **34. (Currently Amended)**   A mass spectrometer according to claim 26[30], wherein said  
12    [MALDI] sample is positioned at an angle to a co-axis of said first and second multipoles.

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14    **35. (Currently Amended)**   A mass spectrometer according to claim 26[30], wherein said third  
15    multipole contains a collision gas to fragment said ions.

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1      36. **(Currently Amended)** A Q-SID-Q-TOF mass spectrometer comprising:  
2                      an ionization source to produce ions;  
3                      a plurality of multipoles comprising at least one quadrupole;  
4                      a collision surface for fragmenting said ions; and  
5                      a time-of-flight mass analyzer to analyze said fragmented ions;[.]  
6                      wherein said plurality of multipoles comprise one quadrupole and first and second multipoles,  
7      and  
8                      wherein said collision surface is positioned between said quadrupole and said second multipole.  
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10     37. **(Original)** A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein said ionization  
11     source is selected from the group consisting of electrospray ionization source, nanospray ionization  
12     source, microspray ionization source, matrix assisted laser desorption/ionization, chemical ionization and  
13     electron ionization.  
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15     38. **(Original)** A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein a potential is  
16     applied between said ionization source and said collision surface to allow said ions to undergo surface  
17     induced dissociation.  
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19     39. **(Original)** A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein a potential is  
20     applied between said ionization source and said collision surface such that said ions pass through all of  
21     said multipoles without colliding with said collision surface.



1     **40. (Cancelled)**

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3     **41. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36 [40],  
4     wherein said first multipole and said quadrupole are arranged coaxially.

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6     **42. (Cancelled)**

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8     **43. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36 [40],  
9     wherein said collision surface is positioned at an angle to a co-axis of said first multipole and said  
10    quadrupole.

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12    **44. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36 [40],  
13    wherein said second multipole comprises a collision gas cell for collisionally cooling said fragmented  
14    ions.

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16    **45. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36 [40],  
17    wherein said first multipole collisionally cools said ions.

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19    **46. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36 [40],  
20    wherein a potential is applied between said ionization source and said collision surface such that said  
21    ions pass through all of said multipoles without colliding with said collision surface.

1     **47. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36[40],

2     wherein said second multipole contains a collision gas to fragment said ions.

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4     **48. (Currently Amended)**   A Q-SID-Q-TOF mass spectrometer according to claim 36[40],

5     wherein said first multipole selects ions of a predetermined m/z range, wherein a potential is applied

6     between said ionization source and said collision surface such that said selected ions will not collide with

7     said collision surface, and wherein said second multipole contains a collision gas to fragment said

8     selected ions. --

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